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DINOSAURS!

• DISCOVER THE GIANTS OF THE PREHISTORIC WORLD •



IDENTIKIT

Learn more about three
fascinating prehistoric creatures

HYRACOTHERIUM 1825

LYCORHINUS 1828

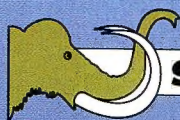
ZEPHYROSAURUS 1829



PREHISTORIC WORLD

Find out about recently
extinct animals in

DEAD AS A DODO 1830



SPOTTER'S GUIDE

Discover the secrets of
PREHISTORIC POND LIFE 1838



TIME DETECTIVE

Step back into the past with
DINOSAUR MUSEUMS 1840



HISTORY IN PICTURES

A DAY IN THE LIFE OF
NANOTYRANNUS 1844



Prehistoric animals starting with
the letters VA to XI 1848

ASK THE EXPERT

Dr David Norman of Cambridge
University answers more of your
dinosaur queries BACK COVER

PLUS



Hyracotherium speed through the
sub-tropical Eocene forests 1834

3-D Gallery

A herd of gigantic *Ultrasauros*
thunders across the land 1836

FACT FILE

More fascinating trivia and the
weekly quiz 1846

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HYRACOTHERIUM

Tiny, dog-sized *Hyracotherium* was the first-known member of the horse family.



Imagine a horse not much longer than your arm, and you will have some idea of how small *Hyracotherium* was. In the thick forests that covered England and the USA in Eocene times, this little, early horse scurried quietly through the undergrowth and browsed on a plentiful supply of plants and shoots.

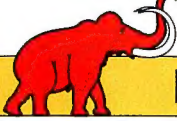
WHAT'S IN A NAME?

When *Hyracotherium* was first found in England, about 140 years ago, scientists did not realise that it was a horse at all – hence its rather strange name, which means ‘mole beast’.

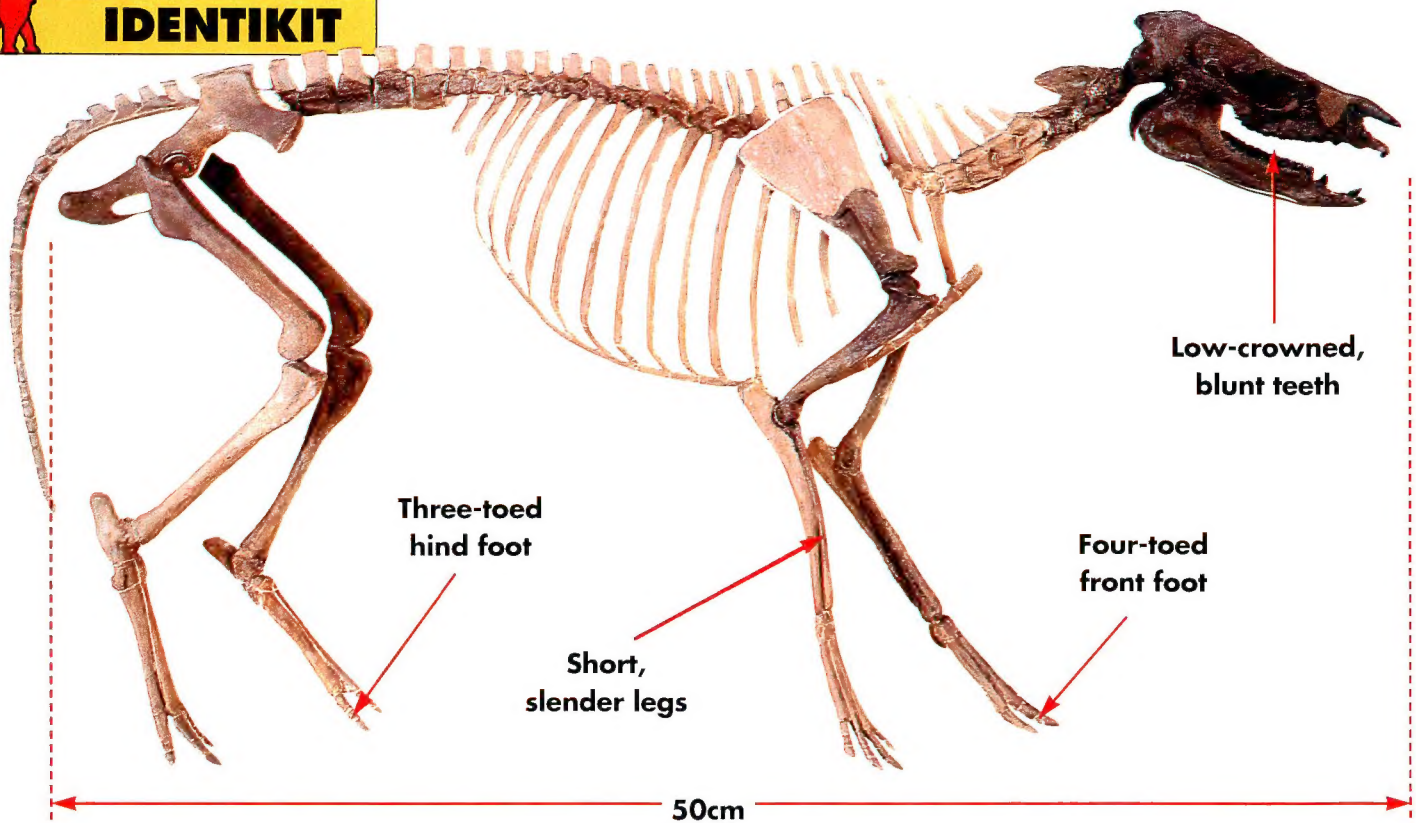
NO CHANGE

In fact, another name – *Eohippus* or ‘dawn horse’ – would have been a much better name for the first horse. However, experts decided to keep the original name, *Hyracotherium*, for the first member of the horse family.





IDENTIKIT



TENDER TOUCH

Hyracotherium had a long head and 44 low, blunt teeth. In the sub-tropical climate of European and North American forests, the leaves on trees and shrubs were lush and tender. This was ideal for *Hyracotherium* as its teeth were not sharp enough to cope with tough vegetation. When grasslands began to replace forests, browsing animals gradually evolved teeth that were better suited to chewing grasses.

IT'S A FACT

STRAIGHT FROM THE HORSE'S MOUTH

Experts can tell a horse's age by looking at its teeth. *Hyracotherium* had 44 teeth but today's adult horse has between 40 and 42. By looking at the number, size and condition of a horse's teeth, it is possible to work out how long it has lived.



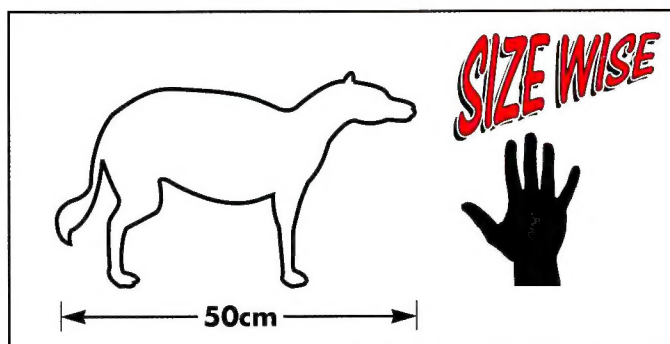


ALERT AND CLEVER

Like the horse of today, *Hyracotherium* was an intelligent animal. It had a large brain for its size, and this, together with its alert senses, may be the reason that horses were able to survive and evolve successfully to the present day.

HIDDEN IN THE FOREST

Like all mammals, *Hyracotherium* must have given birth to live young. At first, the little animal would have fed its tiny babies on its milk. Because they were so small, the babies must have been hidden deep in the undergrowth of the forest to protect them from predators. As they grew up, they learned to eat plants.

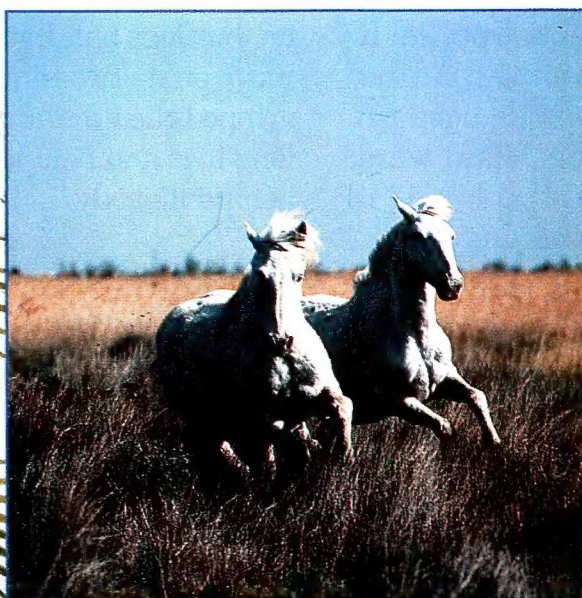


TINY TOES

At the end of its short, slender legs, *Hyracotherium* had tiny, padded hoofs. There were four toes on each of the front feet and three on each hind foot. The bones of its feet were locked together in a way that made them difficult to spread apart.

This meant that much of the animal's weight and balance was centred on its middle toe. Today's horse can gallop gracefully on just one single toe, the other toes having virtually disappeared. They now exist only as thin, tapering bones.

Today's semi-wild horses of the Camargue, southern France, roam freely in great herds.



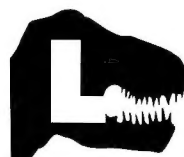
MONSTER FACTS

- **NAME:** *Hyracotherium* (hy-rak-oh-thee-ree-um) means 'mole beast'
- **GROUP:** mammal
- **SIZE:** 50cm long, 40cm high
- **FOOD:** plants
- **LIVED:** about 54 million years ago in the Early Eocene Epoch in England and Wyoming, USA



LYCORHINUS

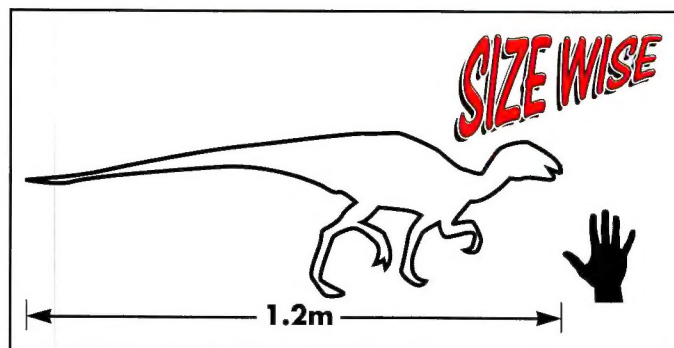
Lycorhinus was only recognised as a dinosaur almost 40 years after it was found.



Lycorhinus was given its name in 1924 by a British palaeontologist. At first, it was thought to be a mammal-like reptile, but it was not until a relative, the dinosaur *Heterodontosaurus*, was described in 1962

that experts realised that

Lycorhinus was a dinosaur and not a mammal-like reptile. It was not surprising that the mistake was made because the only fossils found were part of its skull, a large tusk and some teeth.



GROUND GRIPPER

Lycorhinus was a small, lightly built dinosaur, about as long as a cheetah. It usually walked on four legs but, if it sensed danger, it could move on its two hind limbs. As it ran, it gripped the ground with the claws of its three long toes and held its tapering tail straight behind its body.

FIERCE FANGS

Lycorhinus roamed the semi-deserts of South Africa, searching for plants to eat. It snapped off shoots with its beak, and chewed them with broad, flat cheek teeth. At the front of its jaw two long, fang-like tusks hung down.

MONSTER FACTS

- **NAME:** *Lycorhinus* (lie-koh-rine-us) means 'wolf snout'
- **GROUP:** dinosaur
- **SIZE:** 1.2m long
- **FOOD:** plants
- **LIVED:** about 200 million years ago in the Early Jurassic Period in Cape Province, South Africa





ZEPHYROSAURUS

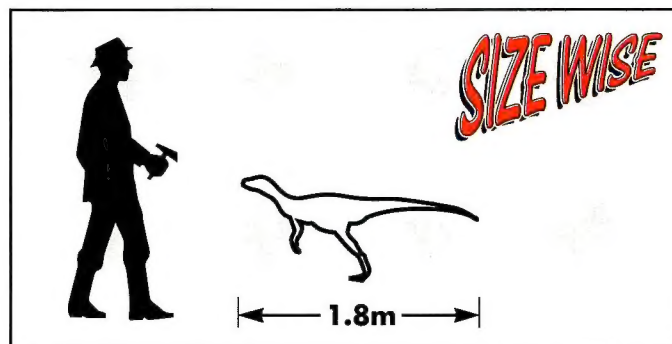
Zephyrosaurus belonged to one of the most long-lived, and therefore successful, groups of dinosaurs.



Hypsilophodontids lived for more than 100 million years, and lived everywhere but Asia. These gazelles of the dinosaur world probably survived by staying constantly alert, ready to sprint off at the first hint of danger. All that remained of *Zephyrosaurus* was part of its skull and backbone, but this was enough to show experts that it was a member of this family of athletes.

GOOD JUMPER

Zephyrosaurus was as long as a large sheep. It had a small head and big eyes. Its back legs were longer than its arms.



DANGER DODGER

Zephyrosaurus had long shin and thigh bones for extra speed. It probably dodged from side to side as it ran, to stop its pursuer catching up.

MEAL MACHINE

Like *Hypsilophodon*, *Zephyrosaurus* probably lived in the safety of a herd. Large groups wandered the open plains of Montana in North America, browsing on plants and leaves. It nipped off shoots with its bony beak, stuffing its cheek pouches with food. With the long cutting edge of its back teeth, *Zephyrosaurus* sliced the food over and over again before swallowing its meal.

MONSTER FACTS

- **NAME:** *Zephyrosaurus* (zef-eye-roh-saw-rus) means 'west wind reptile'
- **GROUP:** dinosaur
- **SIZE:** 1.8m long
- **FOOD:** plants
- **LIVED:** about 120 million years ago in the Early Cretaceous Period in Montana, USA



Dead as a dodo

Extinction did not happen just to animals that lived millions of years ago. Many animals have become extinct only quite recently.



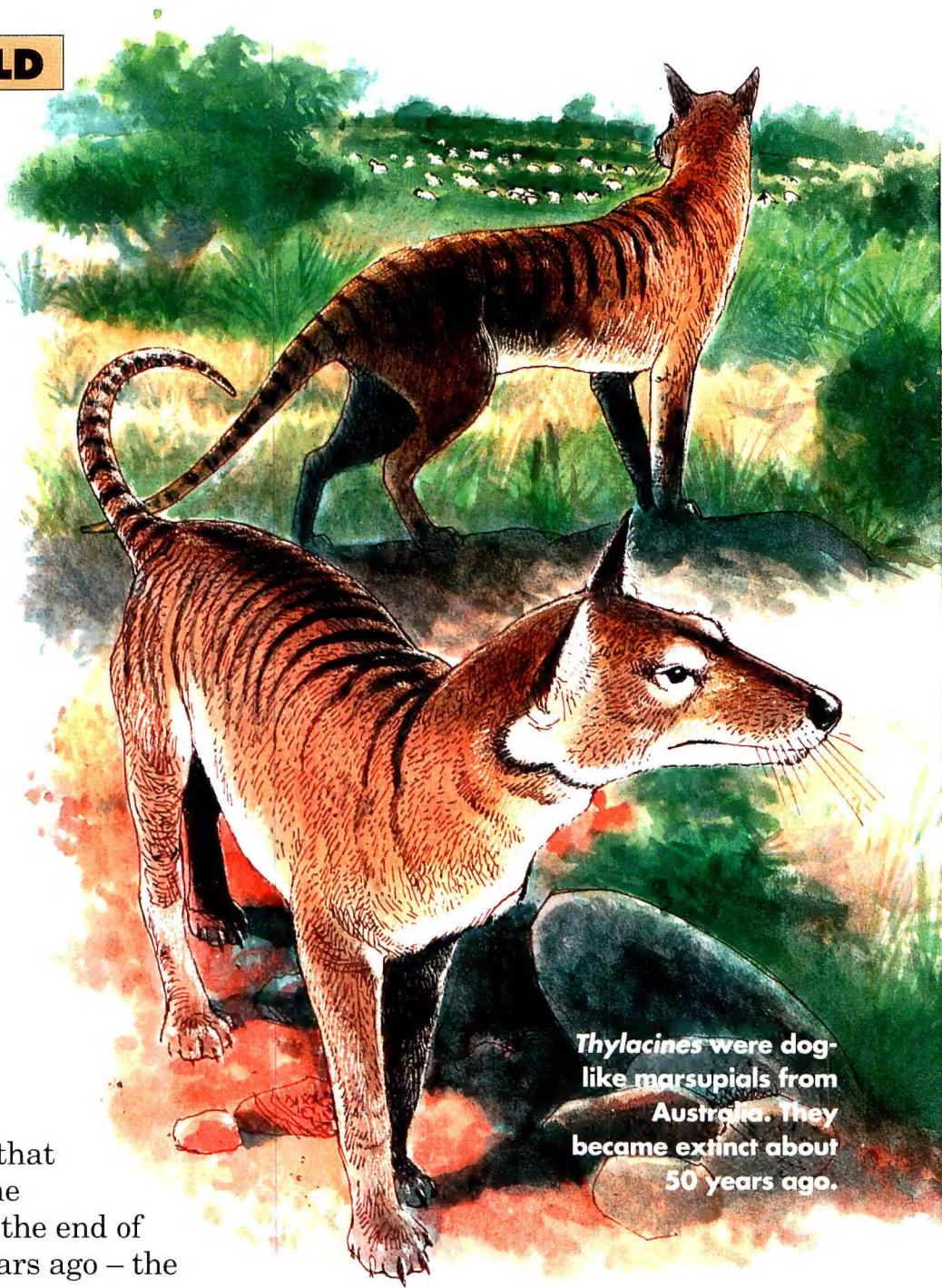
inosaurs became extinct about 66 million years ago.

About five million years ago, many of the strange animals that lived in South America became extinct, too. More recently, at the end of the Ice Age – about 10,000 years ago – the woolly mammoths, woolly rhinoceroses, sabre-toothed cats and many other big mammals became extinct as we entered modern times.

RECENT EXTINCTIONS

Since the end of the Ice Age, human beings have spread out all over the world and become the most powerful species on Earth. Extinction is not something that just happened in the distant past, before human beings. It has happened during recent times, too. In fact, many animals are in danger of extinction today.

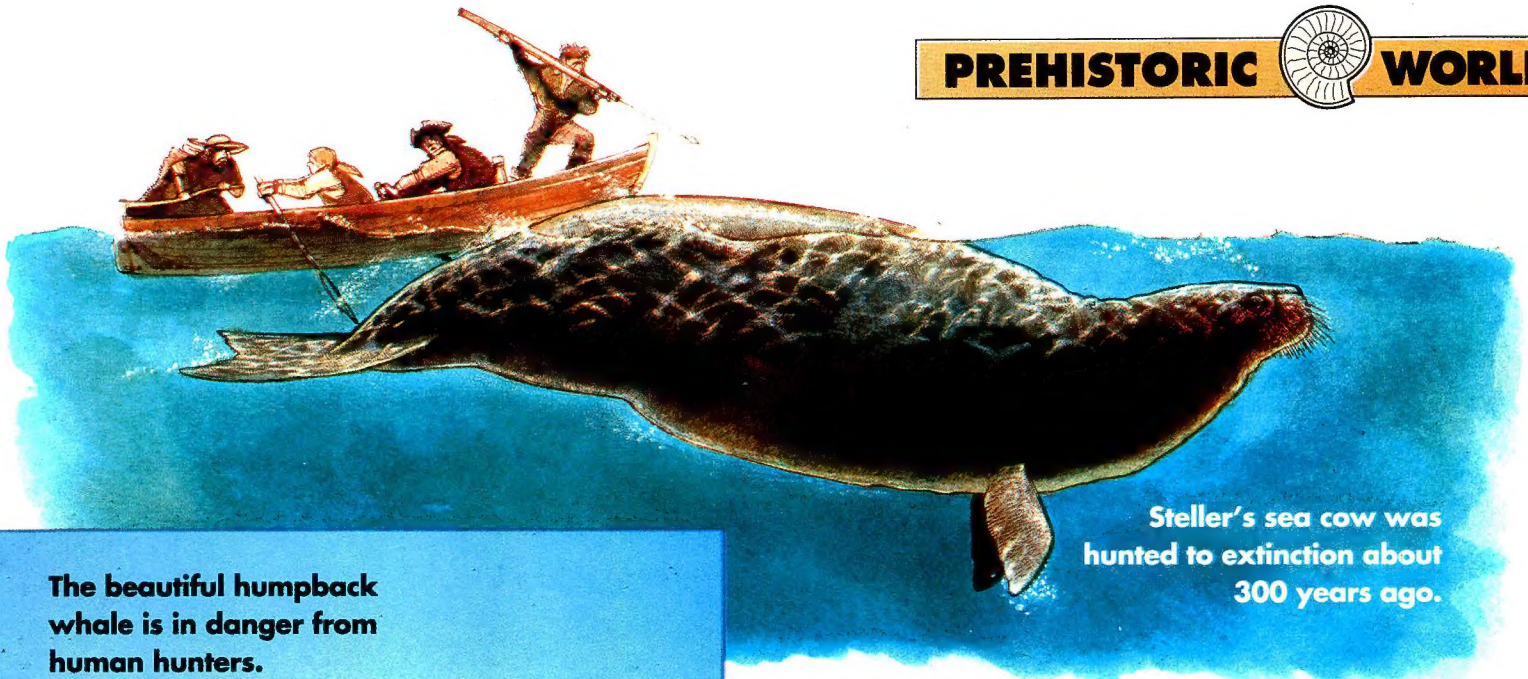
1830



Thylacines were dog-like marsupials from Australia. They became extinct about 50 years ago.

ANIMALS INVADED

Let's take a look at what happened in South America. When the continents moved, volcanoes erupted, mountains rose up, and a land bridge appeared that joined North America to South America. Today, we call this bridge of land Central America. Some of the animals in North America started moving along this bridge into South America and settled there. After a time, the old mammals of South America could not cope with this invasion and many species died out.



Steller's sea cow was hunted to extinction about 300 years ago.

The beautiful humpback whale is in danger from human hunters.

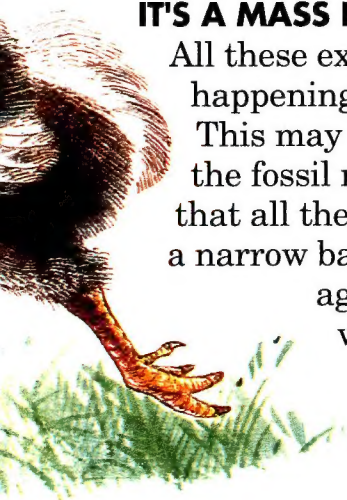


SEA PREY

Hunting does not just happen on land. In the sea, human hunters have caused the extinction of big, slow-moving animals. Steller's sea cow, a kind of manatee that is 10m long, was hunted to extinction in the cold sea between Russia and Alaska in the 18th century. Today's whales may well be in the same sort of danger.

IT'S A MASS EXTINCTION

All these extinctions have been happening over thousands of years. This may sound like a long time, but the fossil record will show scientists that all these extinctions took place in a narrow band of geological time. The age in which we are living will be seen as a mass extinction.



ANOTHER DINO-SIZED EXTINCTION?

It will appear to be greater than the extinction that took place in South America five million years ago, and possibly as great as that which struck the dinosaurs 66 million years ago.

HOPE FOR THE FUTURE

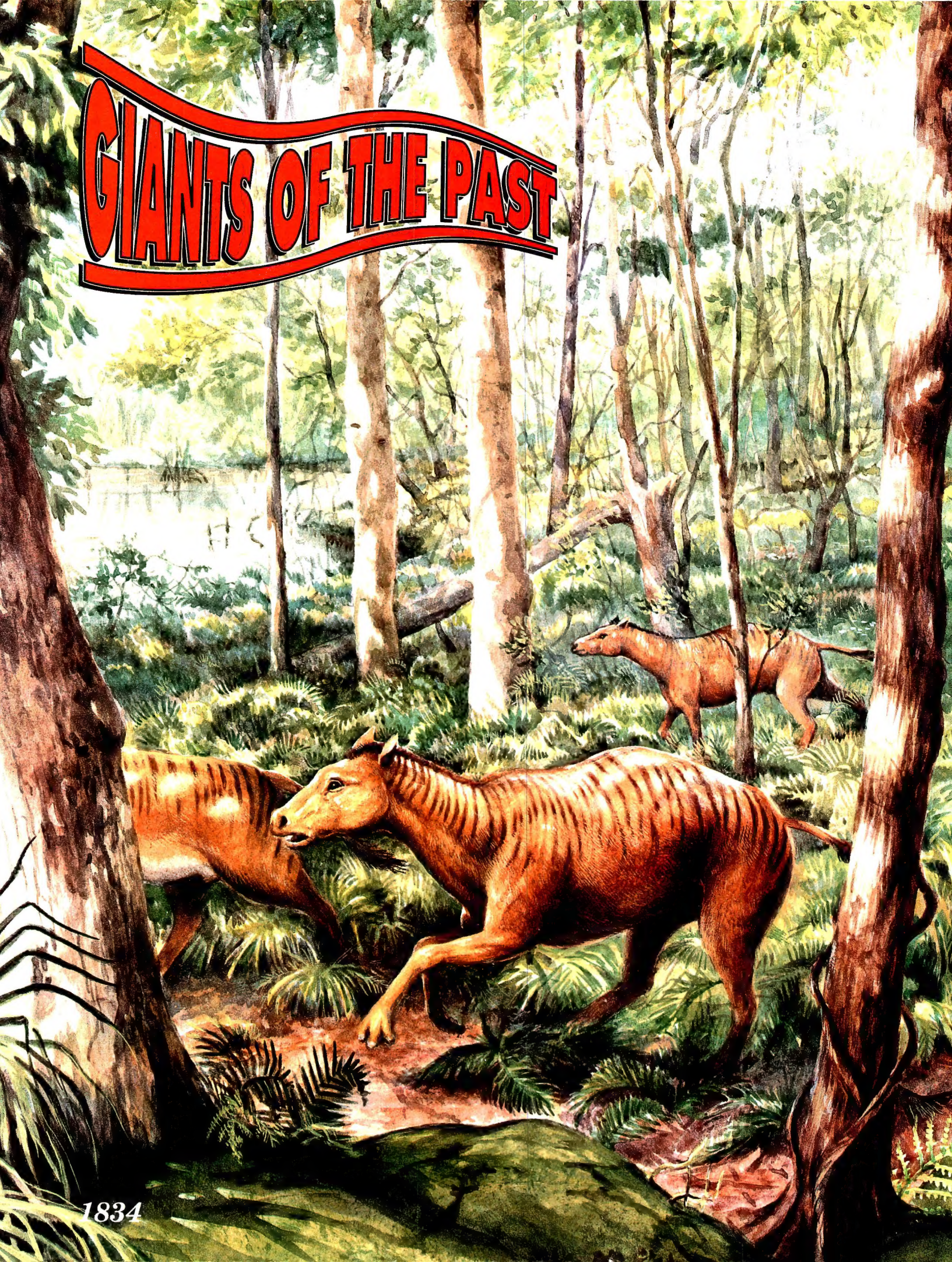
But, as with all extinctions, evolution will hopefully lick its wounds and get back to work. New creatures will eventually evolve to take the place of the ones lost.

IT'S A FACT

SURVIVORS FOR THE FUTURE

It is unlikely that we could wipe out every living thing on Earth. Whatever damage we do, even causing an environmental disaster like a nuclear war, something will survive. It may only be microscopic single-celled creatures in the ocean depths, but the laws of evolution dictate that whatever survives will evolve to populate the Earth.

GIANTS OF THE PAST

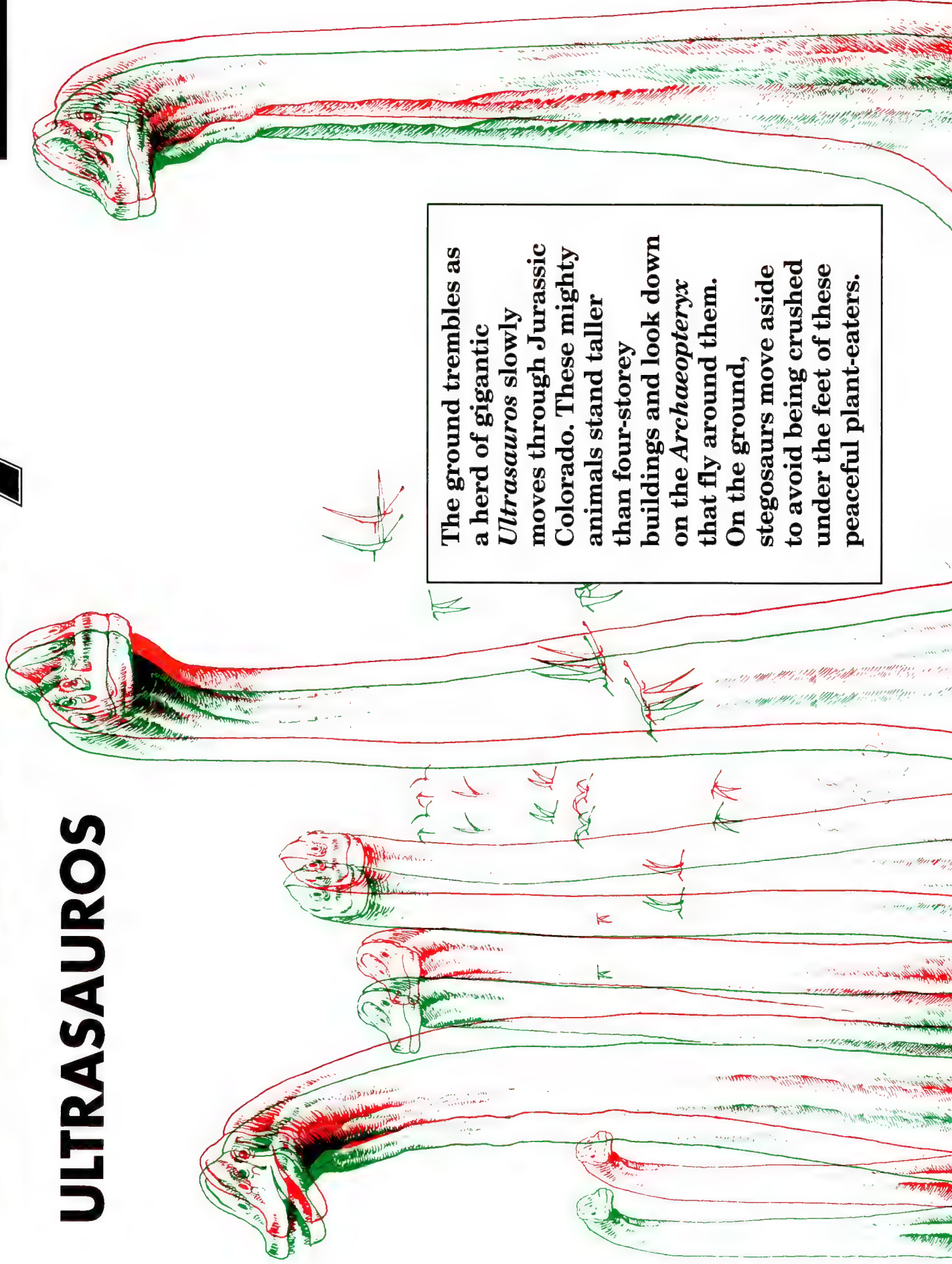


HYRACOTHERIUM

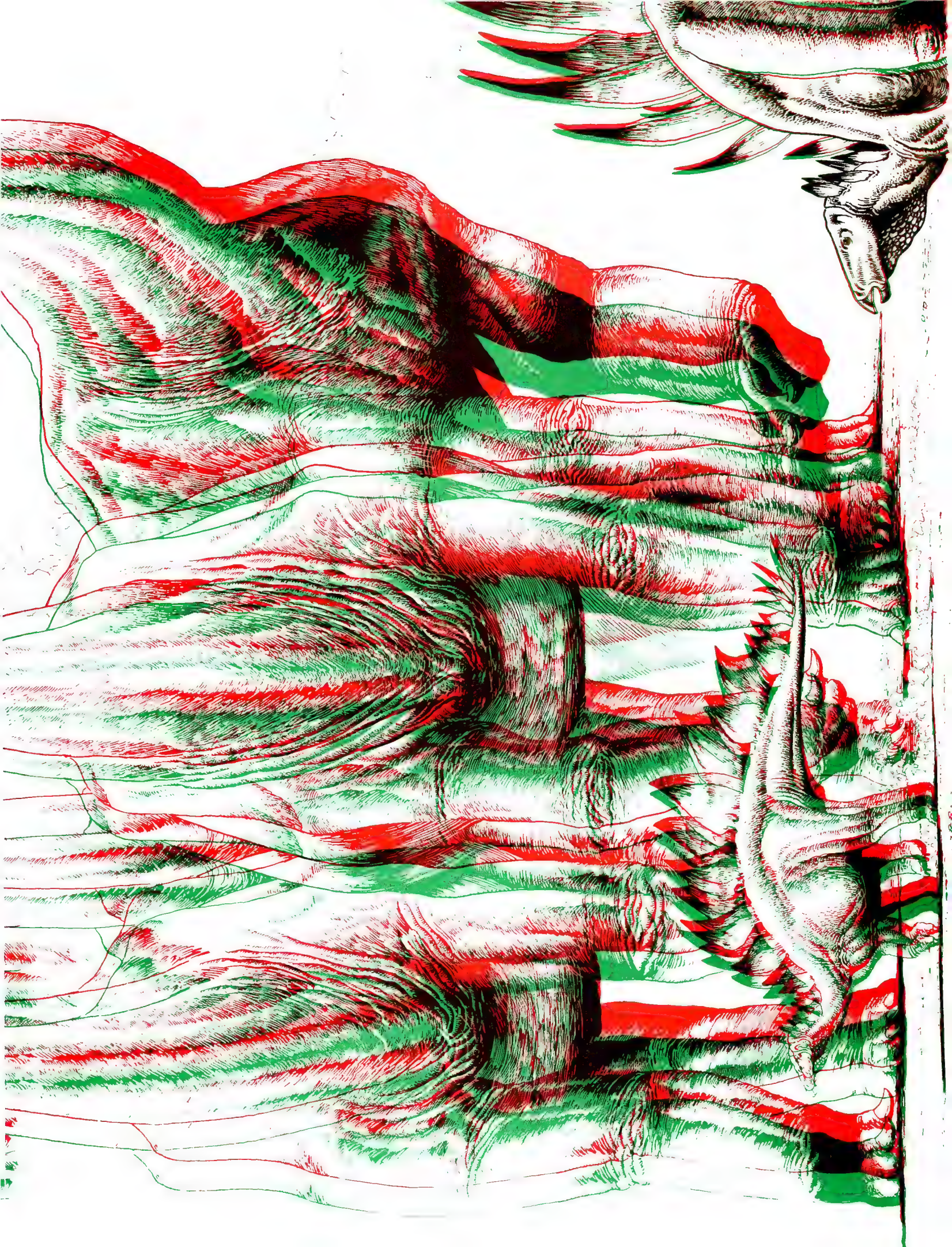


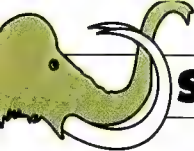
In the dappled light of a semi-tropical glade in Early Eocene North America, a herd of *Hyracotherium* speeds on its way. Looking like miniature horses of today, these small, plant-eating mammals were intelligent and nimble – two characteristics that enabled them to outwit and outrun fierce predators, such as the creodonts that roamed the northern continents.

ULTRASAUROS



The ground trembles as a herd of gigantic *Ultrasauros* slowly moves through Jurassic Colorado. These mighty animals stand taller than four-storey buildings and look down on the *Archaeopteryx* that fly around them. On the ground, stegosaurus move aside to avoid being crushed under the feet of these peaceful plant-eaters.





Prehistoric pond life

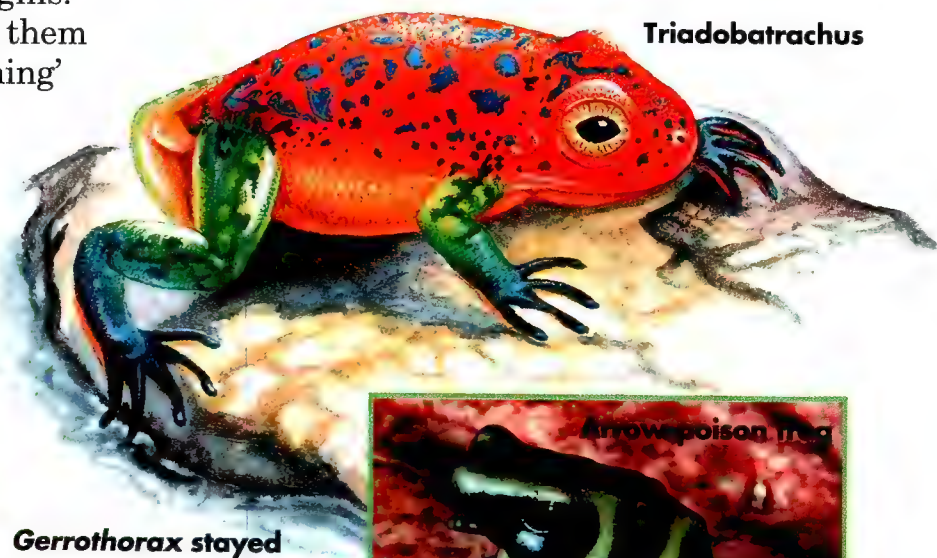
Frogs, toads, newts and salamanders have been stirring pond mud for millions of years.



Today, frogs have adapted to live in deserts, forests and swamps – they can even climb trees. Many of today's frog families can be traced back to the Age of the Dinosaurs, when frogs lived mainly in or near fresh water. Like most amphibians, frogs lay their eggs in water. These grow into tadpoles, which live in the water and breathe through openings called gills. Adult frogs develop lungs to help them breathe on land, but most 'breathing' takes place through their soft, moist skin.



Tadpoles



Triadobatrachus

Gerrothorax stayed like a tadpole all its adult life.



Gerrothorax

THE TADPOLE THAT NEVER GREW UP

Gerrothorax (jer-o-thor-ax) was an extraordinary Triassic creature. It was an enormous amphibian that stayed like a tadpole all its life. Like Peter Pan, *Gerrothorax* never quite grew up! It kept its feathery gills, even when fully grown, and could breathe only in water.

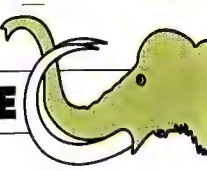
FIRST FROG-LIKE FOSSIL

The fossil of the first frog-like amphibian was found on Madagascar, an island off the coast of East Africa. *Triadobatrachus* lived just before the Age of Dinosaurs.



Arrow-poison frog

Triadobatrachus was the first frog-like amphibian. It lived 240 million years ago, but looked very like today's Arrow-poison frog.



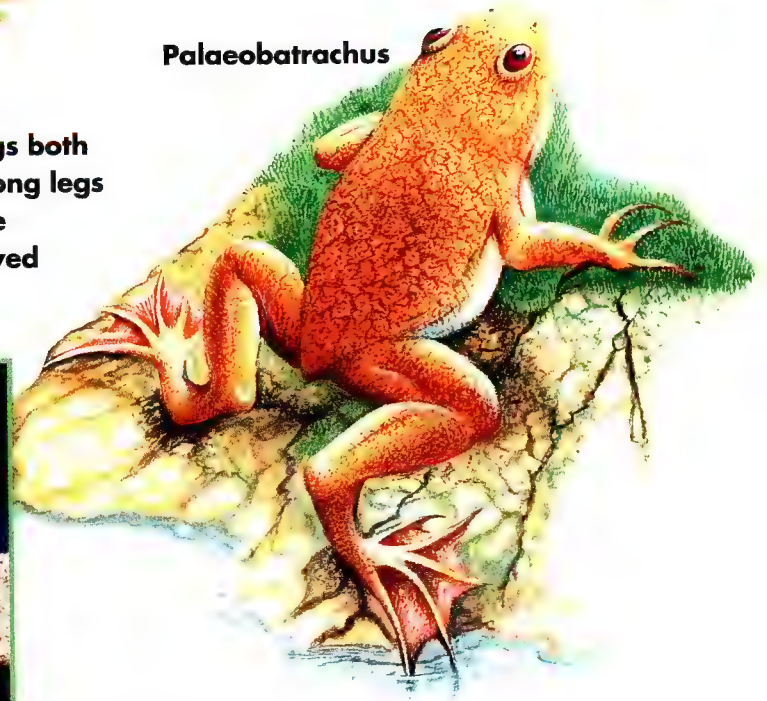
Vieraella



These two early frogs both had no tails and strong legs for jumping, just like today's African clawed toad, below.



Palaeobatrachus



JUMPING GENIUS

It was not until 30 million years later, in the Early Jurassic, that the first true frog appeared. *Vieraella* (vi-rill-a) was about half the length of your thumb. It lived in Argentina, South America, and looked very much like the frogs of today. Its body had no tail and its legs were long, strong and designed for jumping.

WEBBED WONDER

Palaeobatrachus (pal-ee-o-bat-ra-kuss) was more recent. It lived from Eocene to Miocene times in Europe and North America. Experts think it looked very like today's African clawed toad. It was only 10cm long but it swam with great strength and speed with the help of webbed feet.

NEWTS AND SALAMANDERS

Unlike frogs, newts and salamanders do not change very much as they grow. Adults keep the long tail they had as babies, and spend most of their time in water. Salamanders are better equipped for life on land than newts, and live in warmer, drier areas.

SALAMANDER SKELETON

The oldest known salamander skeleton belongs to *Karaurus* (kah-roar-us). It was found in 150-million-year-old rocks in Kazakhstan, Asia. Like salamanders today, it was probably a good swimmer. Its lizard-like shape shows how little salamanders have changed over millions of years.

Late Jurassic *Karaurus* was the first-known salamander. It looked very like today's fire salamander, right.



Dinosaur museums

Where to see some of the best dinosaur collections in the world.

Dinosaurs can come to life again in a good museum display. Until you stand beside a towering fossil skeleton, it's difficult to imagine how big some dinosaurs were. Some museums also have robotic models which move and even roar!

UNITED KINGDOM

Natural History Museum, London

You can handle the teeth, skin and bones on display in the brand new dinosaur gallery. High above, 14 large dinosaurs are suspended in mid-air. A trio of *Deinonychus* feast on a freshly killed *Tenontosaurus* in a life-sized robotic display that also roars. One of the world's great collection of dinosaur fossils is kept here, behind the scenes.



1840



Royal
Ontario
Museum,
Toronto

The Dinosaur Museum, Dorchester

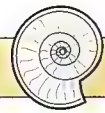
This has a vast reconstruction of *T rex*, as well as models of *Stegosaurus* and *Triceratops*. A rare *Magalosaurus* fossil trackway shows two predators going in opposite directions.

CANADA

Royal Ontario Museum, Toronto, Ontario

The fearsome meat-eaters *Allosaurus* and *Albertosaurus* are among the fine dinosaur skeletons on display. A good skeleton of a duck-billed *Hadrosaurus*, one of the first dinosaurs from North America to be named, is also on show.





NEW AND POWERFUL

One of the main causes of extinction is thought to be when a new, powerful animal comes into an area and takes over from the animals that were there already. It is a process that is still happening today.

TOP DOG AND UNDERDOG

A dog-like marsupial called a *thylacine* (thy-la-sine), the 'marsupial wolf', was one of the main hunters in Australia until about 30,000 years ago. At that time the first people arrived, bringing dogs with them. Some of these dogs became wild and, after many years, became today's dingo. Dingos are so good at hunting that they replaced the *thylacine*, which became extinct about 50 years ago.



Ring-tailed lemurs are one of the surviving species of lemur on Madagascar.

GREEDY GOATS

Giant tortoises, on the Galapagos and Aldabra Islands, are an endangered species. When people arrived on the islands they brought goats with them. These goats competed with the tortoises for food.

HOMELESS

Animals are susceptible to changes in their environment. The only place we find lemurs today is in the forests of Madagascar. These forests are being cleared away for use as farmland. Many species of lemur have become extinct because of environmental changes.

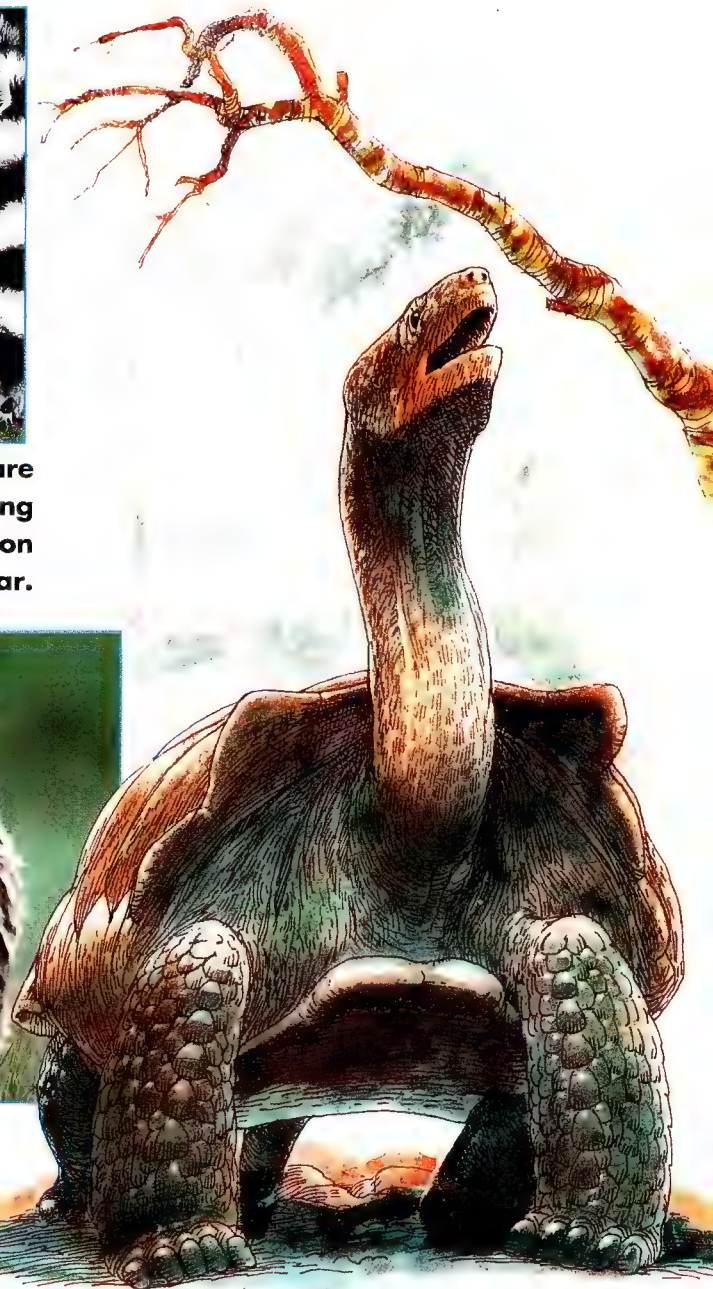


Giant tortoises are endangered by other animals, such as goats, which compete for food.

Is it true

that many different kinds of animal have recently become extinct?

Yes. The long list includes butterflies, large and small mammals, birds, spiders, fishes, amphibians and reptiles. Many species today, such as the tiger and the giant tortoise, are in grave danger of extinction. Conservationists have made a list of endangered species, known as the 'Red Book', to make people more aware of extinction.





DANGEROUS HUMANS

So animals have become, and are still becoming, extinct because humans have interfered. Humans have brought new animals into their habitats. Sometimes, they have changed the natural habitats into farmland. It looks as if human beings are the biggest cause of extinction in recent history.

QUICK FOOD

Humans also make animals extinct by hunting and killing them. People have to eat, and when they find animals that are easy to catch, they hunt them. In a land where no human has been seen before, the animals have no knowledge and no fear of people so they are easily hunted.

Flightless birds, like this moa, had very few defences against human hunters.

HUNTING OF THE DODO

The dodo, the flightless bird of Mauritius, which is an island in the Indian Ocean, was hunted to extinction in 1681. The moas, the giant flightless birds of New Zealand, died out about 700 years ago, after centuries of hunting by Maori settlers. These flightless birds were unused to humans and so trusted them.

LOST BIRDS

Some people think that the death of all passenger pigeons is the most terrible extinction caused by humans. Huge flocks of these birds used to fly in the skies above North America. They were slaughtered in their thousands for meat. The pigeons

were so easy to shoot that the species was completely wiped out by 1914.

THE GREAT AUK

The great auk (awk) has a similar story. This sea bird, rather like a penguin, lived on the shores of Greenland, Iceland and the British Isles. Like the penguin, it was a slow-moving, waddling bird, easily caught. It nested on the ground, so its eggs were easily collected. Sailors raided their colonies for meat and eggs until they were all gone.

The last one was seen in 1844.



Great auk

1832



The dodo is one of the most famous extinct animals. The last one was seen in 1681.

An exhibit
being
constructed at
the Tyrell
Museum of
Palaeontology,
Alberta.



Tyrell Museum of Palaeontology, Drumheller, Alberta

One of the biggest dinosaur collections in the world, with more than 200 specimens on display. Most of the exhibits were found in Alberta – many in nearby Dinosaur Provincial Park. You can also design your own dinosaur on computer.

National Museum of Natural Sciences, Ottawa, Ontario

A remarkable collection of dinosaurs from Western Canada. Fine skeletons of *Anchiceratops* and *Styracosaurus* point their horns at visitors. There is a model of *Troodon* and a remarkable *Euplocephalus* tail club.

POLAND

Institute of Palaeobiology, Academy of Sciences, Warsaw.

This museum contains one of the most amazing dinosaur finds – the giant arms of *Deinocheirus*. No other remains have been discovered of this massive meat-eater. Another massive Mongolian carnivore, *Tarbosaurus*, is also on show.

A *Tarbosaurus*
leg at the Institute
of Palaeobiology,
Warsaw.



One of the impressive exhibits
at the Royal Ontario Museum.

GERMANY

Natural History Museum, Berlin

The largest dinosaur skeleton ever displayed, *Brachiosaurus*, towers over visitors. The museum has pieces of two African dinosaurs brought back in about 1910. Also on show is the most complete *Archaeopteryx* fossil.

BELGIUM

Royal Institute of Natural Sciences, Brussels

In 1878, Belgian miners discovered a mass grave of *Iguanodon*. More than 30 of these skeletons glare out of huge cases at the museum, which makes it the world's largest collection of *Iguanodon*.

IT'S A FACT

MEET THE DINOSAURS

When you walk through Europe's biggest dinosaur park at Müncheningen, near Hanover, Germany, you can see more than 100 life-size dinosaur models.

UNITED STATES OF AMERICA**American Museum of Natural History,
New York City, New York**

The biggest dinosaur collection in the US. A spectacular *Barosaurus* skeleton rears up to defend its baby from a pack of hungry *Allosaurus*. The collection includes skeletons and skulls, eggs, impressions of skin, and tracks. You can also see one of only two mummified dinosaur fossils.

**National Museum of Natural History,
Smithsonian Institution, Washington**

This is one of North America's most important collections. A menacing crowd of dinosaur recreations takes centre stage; there is an adult and a young *Camptosaurus*, and a cast of eggs laid by *Troodon*. You can even ride a life-sized model of *Triceratops*!

**The Carnegie Museum of
Natural History,
Pittsburgh,
Pennsylvania**

The third largest dinosaurs collection in the US, this is known as the 'Home of the Dinosaurs'. A gigantic *Diplodocus* stretches across the hall. It was the first dinosaur discovered by the museum and copies were sent to nine other museums.

**Dinosaur National Monument,
Jensen, Utah**

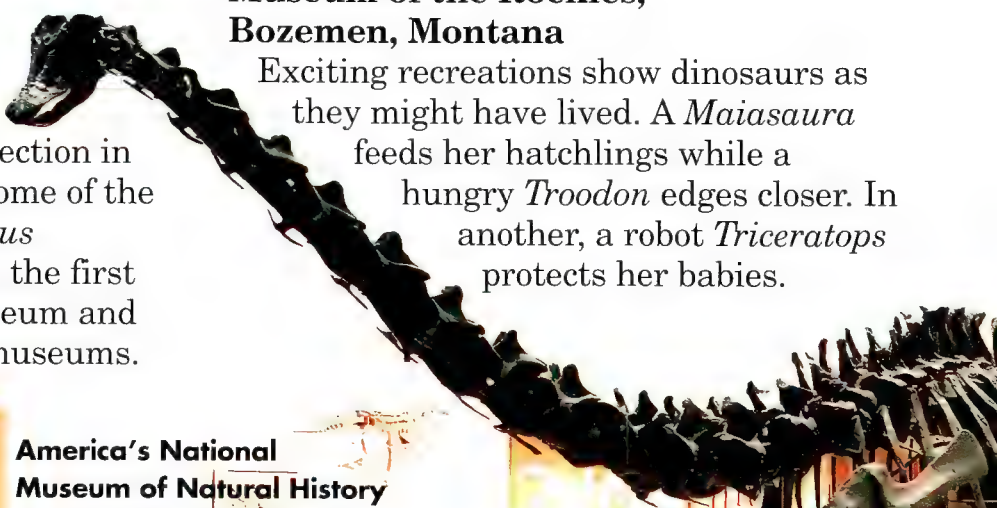
You can see dinosaur fossils in the wall of the Dinosaur Quarry here, where more than 1,600 dinosaur bones have been found. Plus the world's smallest *Stegosaurus* – 'Baby Stego'.

**The Peabody Museum of
Natural History, Yale
University, Connecticut**

The Great Hall of Dinosaurs contains a vast, prize-winning wall painting, 'The Age of the Reptiles'. There is a giant *Apatosaurus* collected by the museum's first curator. There are also two mounted skeletons and a fleshed-out model of *Deinonychus*.

**Museum of the Rockies,
Bozemen, Montana**

Exciting recreations show dinosaurs as they might have lived. A *Maiasaura* feeds her hatchlings while a hungry *Troodon* edges closer. In another, a robot *Triceratops* protects her babies.



America's National
Museum of Natural History
has a great collection of
dinos for you to look at.



A reconstruction of *Stegosaurus* at the Dinosaur National Monument, Utah, USA.

ARGENTINA

Museum of Natural Sciences, Buenos Aires

The richest store of dinosaur discoveries in South America. You can see *Saltasaurus*, the strange, armoured dinosaur protected by a body shield of bony plates and studs.

AUSTRALIA

Museum of Victoria, Melbourne

A life-sized model of the remarkable Chinese dinosaur, *Tsintosaur*, is on show. There is also a cast of a *T rex* skull, with teeth.

RUSSIA

Palaeontological Institute, Academy of Sciences, Moscow

A *Probractosaurus* skeleton crouches over its nest. And a parrot-beaked *Psittacosaurus* leans forwards to graze. Other remarkable Mongolian dinosaurs on show are *Tarbosaurus* and *Talarus*.

IT'S A FACT

TRACE THE TRACKS

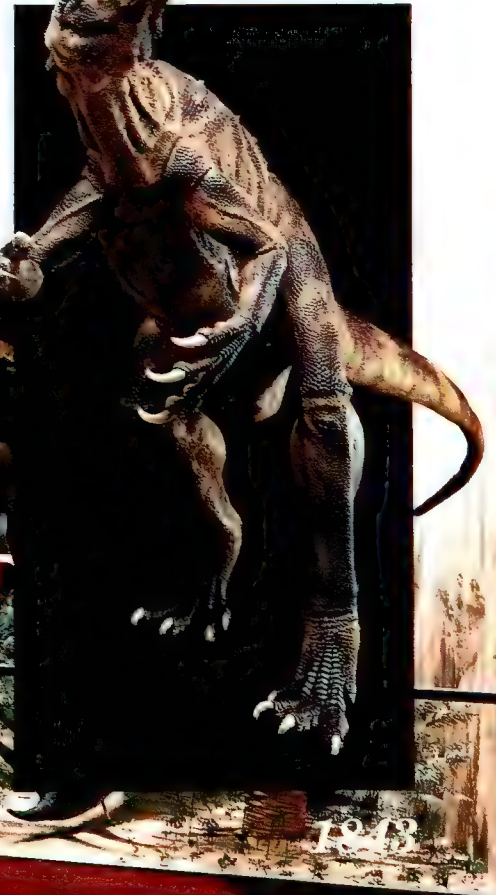
Hunt the sauropod with *T rex* at Dinosaur Valley Park, Glen Rose, Texas, USA. The tracks can be followed along a dry river bed.

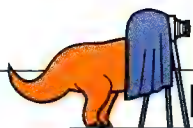
CHINA

Zigong Dinosaur Museum, Zigong, Sichuan

A splendid museum has been built over a quarry that is rich in dinosaur fossils. The giant bones of *Shunosaurus* skeletons stick up out of the rock. A towering *Omeisaurus*, with a neck five times longer than a giraffe, is also on show at this museum.

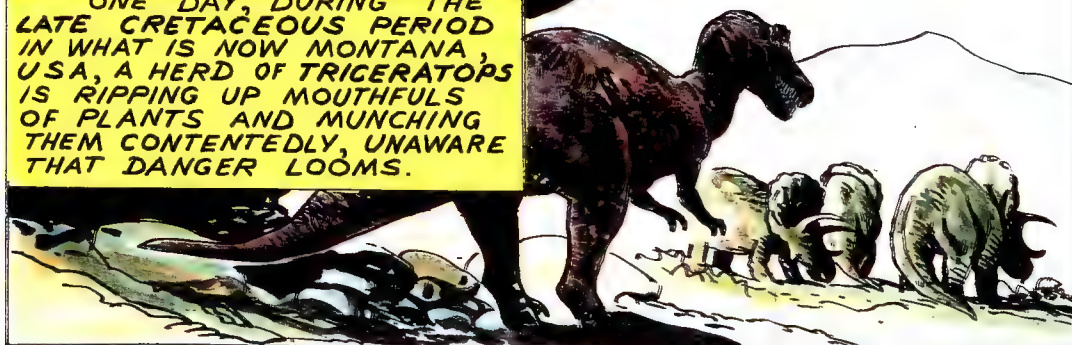
A reconstruction of *Herrerasaurus*, part of 'DNA to Dinosaurs' at the Field Museum, Chicago, USA.



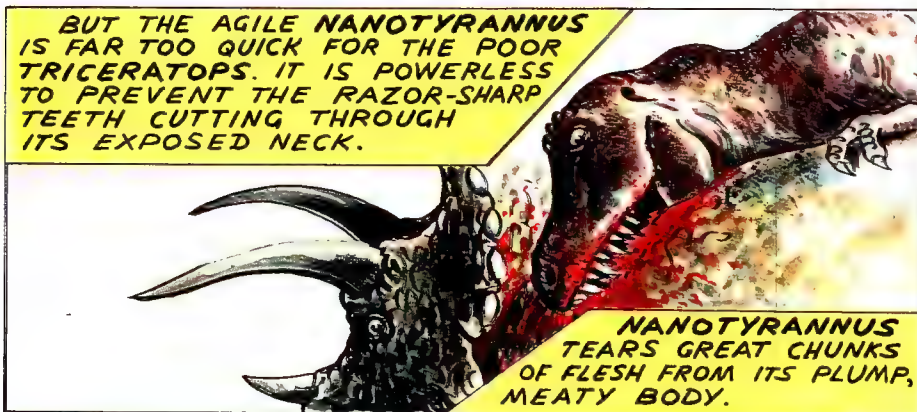


A DAY IN THE LIFE OF NANOTYRANNUS

ONE DAY, DURING THE LATE CRETACEOUS PERIOD IN WHAT IS NOW MONTANA, USA, A HERD OF TRICERATOPS IS RIPPING UP MOUTHFULS OF PLANTS AND MUNCHING THEM CONTENTEDLY, UNAWARE THAT DANGER LOOMS.

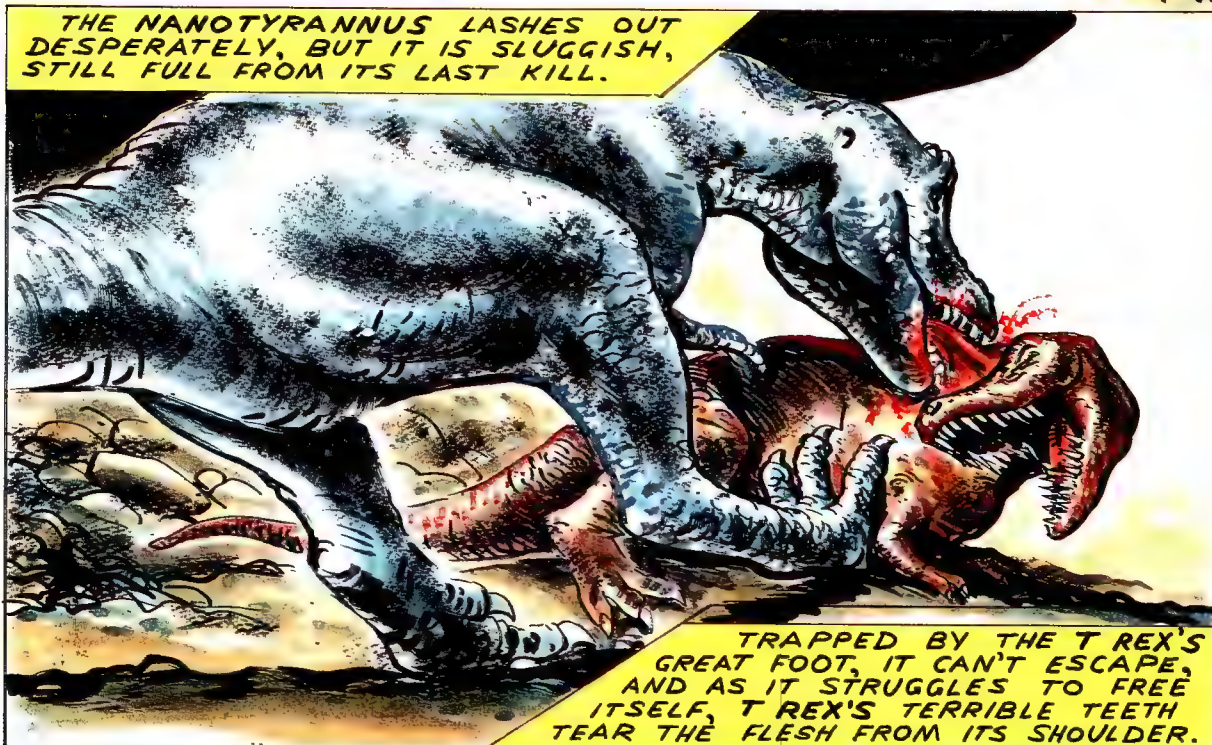


BUT THE AGILE NANOTYRANNUS IS FAR TOO QUICK FOR THE POOR TRICERATOPS. IT IS POWERLESS TO PREVENT THE RAZOR-SHARP TEETH CUTTING THROUGH ITS EXPOSED NECK.



NANOTYRANNUS TEARS GREAT CHUNKS OF FLESH FROM ITS PLUMP, MEATY BODY.

THE NANOTYRANNUS LASHES OUT DESPERATELY, BUT IT IS SLUGGISH, STILL FULL FROM ITS LAST KILL.

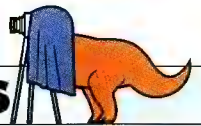


TRAPPED BY THE T REX'S GREAT FOOT, IT CAN'T ESCAPE, AND AS IT STRUGGLES TO FREE ITSELF, T REX'S TERRIBLE TEETH TEAR THE FLESH FROM ITS SHOULDER.

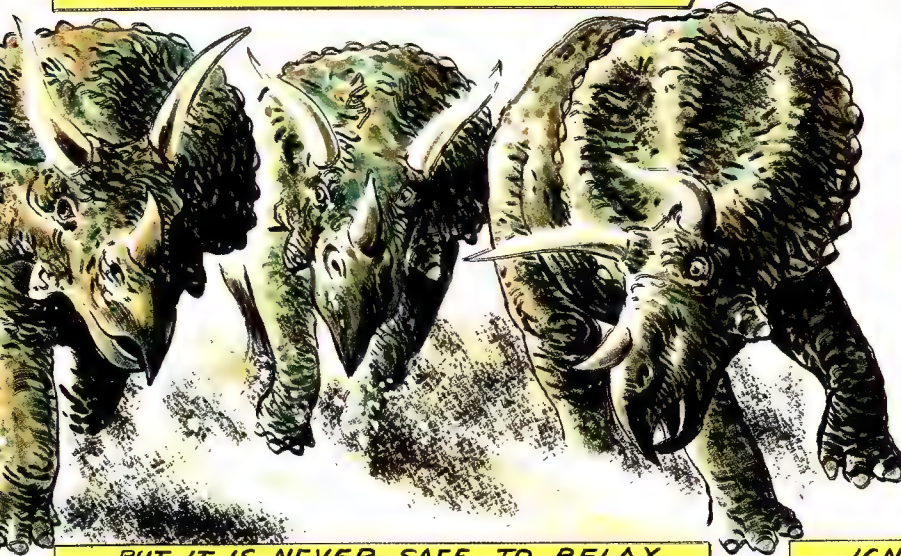


AFTER IT HAS EATEN ALL IT CAN, THE NANOTYRANNUS SNOOZES IN THE SHADE.

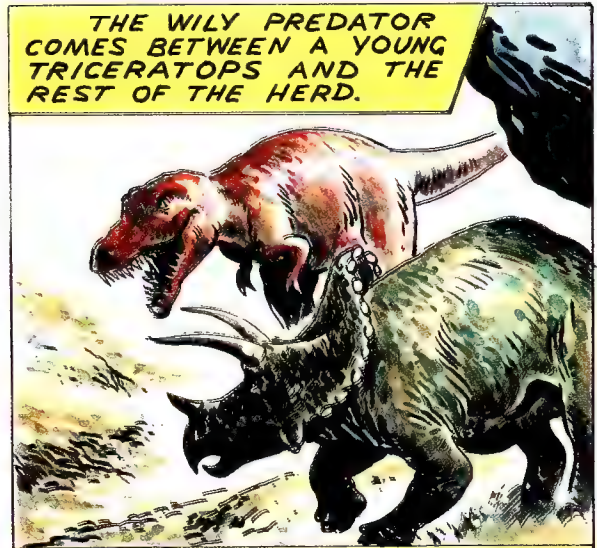




SUDDENLY, AS IF OUT OF NOWHERE, A FEROCIOUS NANOTYRANNUS RACES ACROSS THE DUSTY GROUND TOWARDS THE HARMLESS HERD. THE TERRIFIED PLANT-EATERS RUN FOR THEIR LIVES.

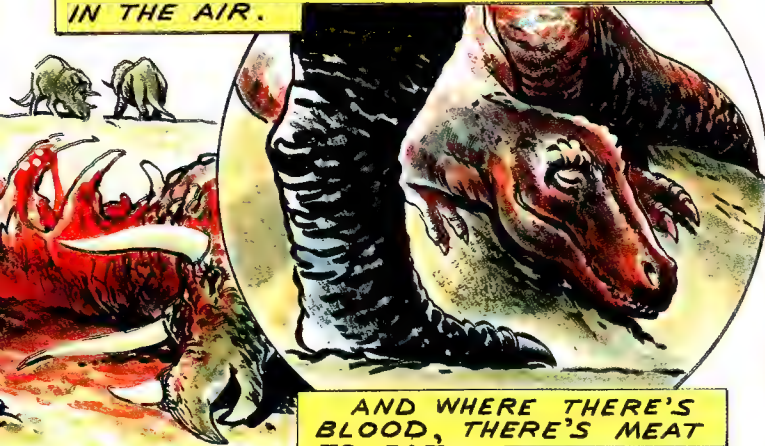


THE WILY PREDATOR COMES BETWEEN A YOUNG TRICERATOPS AND THE REST OF THE HERD.

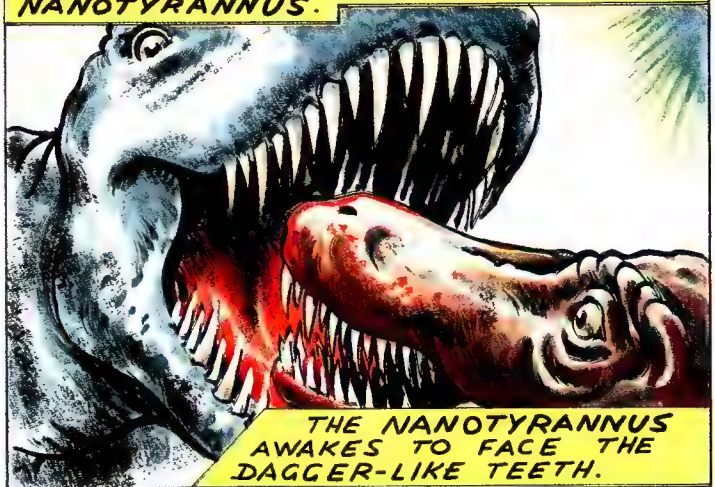


IF THE YOUNGSTER CAN TURN ROUND QUICKLY ENOUGH IT MAY BE ABLE TO GORE THE KILLER WITH ONE OF ITS HORNS.

BUT IT IS NEVER SAFE TO RELAX IN THE HARSH PREHISTORIC WORLD. A TYRANNOSAURUS REX, A MUCH LARGER MEAT-EATER THAN SLEEPING NANOTYRANNUS, HAS SMELT BLOOD IN THE AIR.



IGNORING THE HERD OF TRICERATOPS AND THE SHREDDED REMAINS OF ONE OF THEIR NUMBER, THE GREAT T REX BEARS DOWN ON THE BLOOD-SMEARED NANOTYRANNUS.



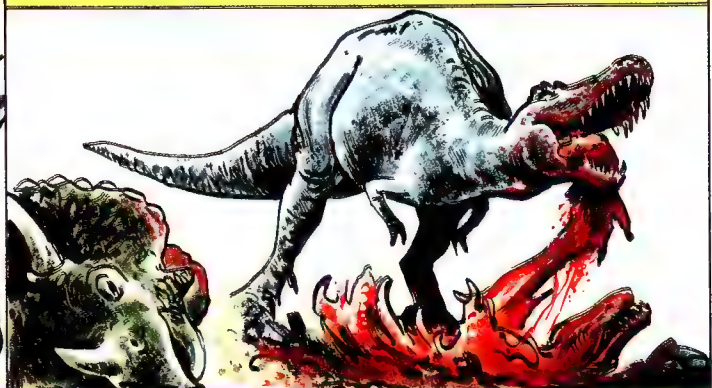
THE NANOTYRANNUS AWAKES TO FACE THE DAGGER-LIKE TEETH.

SOMEHOW THE NANOTYRANNUS STRUGGLES LOOSE AND TRIES TO FLEE.



BUT THE MUCH LARGER ANIMAL CAN EASILY CATCH THE MORTALLY WOUNDED BEAST.

THE T REX EATS AS MUCH AS ITS HUGE BELLY CAN HOLD. WHEN IT HAS FINISHED, IT WILL WANDER OFF...



... LEAVING BEHIND THE REMAINS OF A DOCILE PLANT-EATER AND ITS RUTHLESS KILLER.

Improve and test your
knowledge
with...

FACT FILE

Fascinating facts
to read and
10 fun questions
to answer!

Animal or person?

Joshua Platt of Oxford studied some dinosaur vertebrae and leg bones in 1758 and thought that they had come from a hippopotamus or a rhinoceros, although his colleagues were convinced that they belonged to a sinner drowned in the Biblical Flood.

- 1** Giant tortoises are endangered because:
- a) goats eat their food
 - b) they move too slowly
 - c) they have outgrown their shells

- 2** *Ultrasauros* lived in:
- a) Cape Province, South Africa
 - b) Colorado, USA
 - c) Madagascar, East Africa

- 3** *Weigeltisaurus* was one of the first reptiles to:
- a) swim under water
 - b) grow fur
 - c) glide through the air

- 4** How many dinosaurs are there still to find?
- a) None
 - b) One or two
 - c) Lots

- 5** *Xiphactinus* caught its prey by:
- a) treading on it
 - b) running after it
 - c) sucking it in

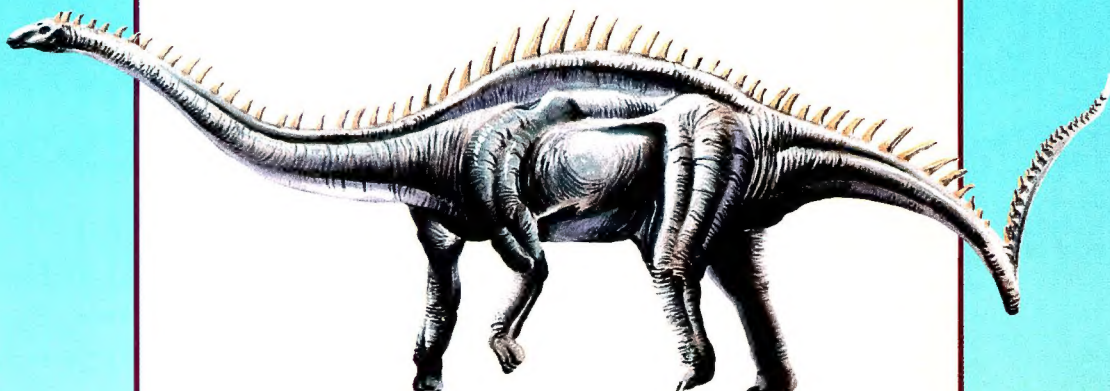
- 6** *Lycorhinus*' name means:
- a) like a rhino
 - b) west wind reptile
 - c) wolf snout

- 7** The largest dinosaur skeleton ever displayed is:
- a) *Brachiosaurus*
 - b) *Zephyrosaurus*
 - c) *Stegosaurus*

- 8** *Hyracotherium* fed its babies on:
- a) grass
 - b) milk
 - c) meat

- 9** Experts can tell a horse's age by looking at:
- a) Its feet
 - b) Its teeth
 - c) Its tail

Spiny sauropod



Sauropods, such as Diplodocus, were always shown as having elephant-like skin. But in 1990, a new Diplodocus skeleton was found which had fossilized skin impressions. These indicated that it had a row of spines running down its neck, back and tail! Perhaps other sauropods had these spines too.

Peek-a-boo

Hippopotamus gorgops, living in Pleistocene East Africa, had eyes on stalks so that it could live mostly in the water.

Observant king

When the skeleton of over 40 Iguanodon were being excavated and mounted in the late 1800s at Bernissart in Belgium, King Leopold of Belgium came to inspect the work. He remarked that the Iguanodons looked like giraffes. Indeed the heads were the same shape and size and they had long necks for reaching up into trees.

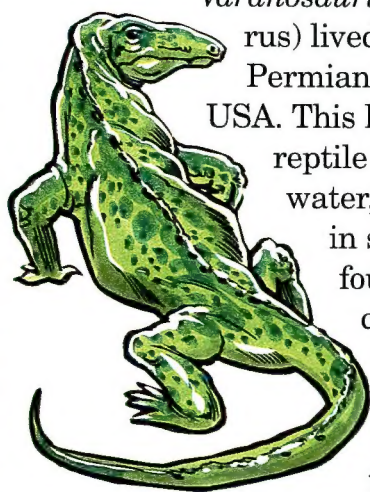
Misprints

Many dinosaur footprints seem to be very light, as though they were made by an animal floating in water. It now seems that these are just the impressions left below the original footprints, and that the actual footprints were washed away. Scientists call these 'undertracks'.

10

Which prehistoric frog, like Peter Pan, never grew up?

- a) Gerrothorax
- b) Palaeobatrachus
- c) Triadobatrachus

VARANOSAURUS**280 MYA**

Varanosaurus (va-ran-noh-saw-rus) lived in the Early Permian Period in Texas, USA. This little mammal-like

reptile probably lived near water, on flood-plains and

in swamps where it found its food. It

caught fish by snapping them

up in its deep, narrow jaws. It

then sliced up its

meal with small, spiky

teeth. Its name means 'dragon reptile'.

W**WEIGELTISAURUS****270 MYA**

One of the first reptiles to glide through the air, *Weigeltisaurus* (wy-gelt-ih-saw-rus) was a dainty, lizard-like animal, about as long as today's grey squirrel. It moved from tree to tree with the help of fragile 'wings'. These were slender ribs, covered with skin, which stood out on each side of its body.

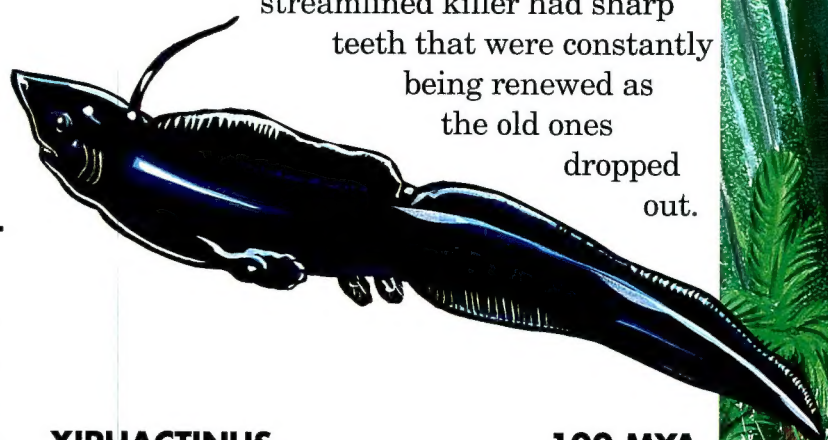
Weigeltisaurus lived in the Permian Period in England, Germany and in Madagascar, an island off the coast of East Africa.

**X****XENACANTHUS****350 MYA**

Living in the Late Devonian to Mid Permian times in the Americas, Europe and Australia, *Xenacanthus* (zen-a-can-thus) was one of the earliest sharks, and looked rather like a cross between today's shark and an eel.

Xenacanthus, which means 'strange spike', was about 75cm long, had one long fin down its back, and a spine jutting out from its head. With its tail tapering to a point, this

streamlined killer had sharp teeth that were constantly being renewed as the old ones dropped out.

**XIPHACTINUS****100 MYA**

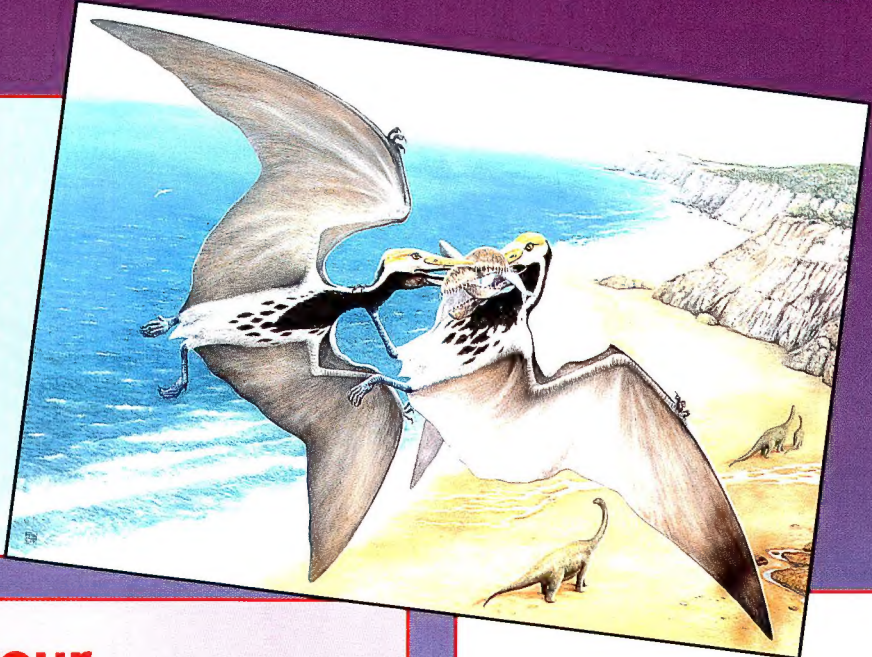
Xiphactinus (zy-fak-tin-us) was a huge ray-fin fish that swam in seas that covered the south of the USA in the Cretaceous Period. Longer than a car, it needed a constant supply of food to keep going. Using its fins to control the movements of its body, this giant fish could move swiftly and with great accuracy when chasing its prey. As it came near its victims, *Xiphactinus* opened its jaws and sucked them in. Experts have found that it even ate its own relatives. *Xiphactinus* means 'sword-fin'.

MYA = MILLION YEARS AGO

COMING IN PART 78 OF

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Three fascinating creatures in **IDENTIKIT** and **HISTORY IN PICTURES 3-D GALLERY**
GIANTS OF THE PAST

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ANSWERS TO FACT FILE QUESTIONS: 1.a 2.b 3.c 4.c 5.c 6.c 7.a 8.b 9.b 10.a



Dr David Norman of Cambridge University answers your dinosaur questions

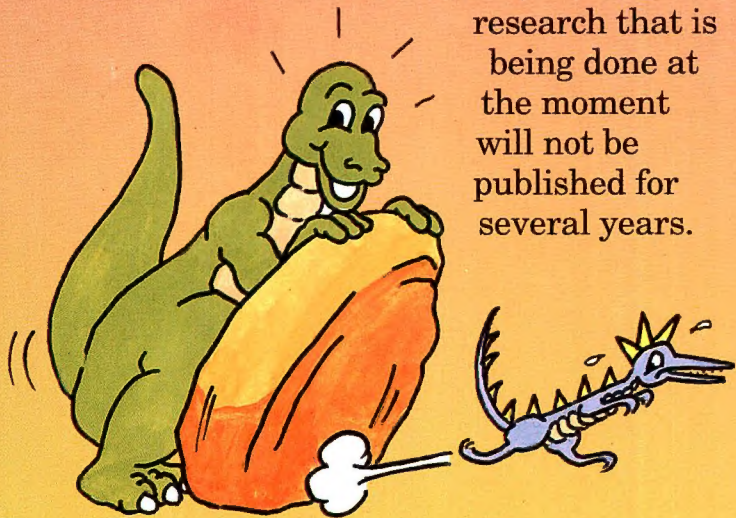
ASK THE EXPERT



Are there lots more dinosaurs still to be discovered?

Yes there are. Each year, new dinosaurs are being discovered by people running expeditions in many different parts of the world. We have really only started to scratch the surface of the dinosaur world, and the

research that is being done at the moment will not be published for several years.



What is the dinosaur question children most often ask you?

There are lots of really popular questions, including: 'Which dinosaur was strongest?', 'Which was the fiercest dinosaur?', 'Why did dinosaurs die out?', 'Which was the fastest dinosaur?', 'How big was *Velociraptor*?', 'Could dinosaurs spit?', 'How do you become a palaeontologist?', and 'Do palaeontologists earn money?'

Which dino do you like best?

This has to be *Iguanodon*. It was the first dinosaur that I studied as a graduate student at university. By studying this animal, I learned a great deal about how to be a

palaeontologist, and how important it is to be extremely careful and thorough in everything you do. If you miss the tiny details, you might miss the most important pieces of information.

Were there any armoured meat-eating dinosaurs?

I know of very few dinosaurs that were both armoured and meat-eating. Most meat-eaters are designed to chase food and therefore wouldn't want to make themselves too heavy by piling on armour. But the skeleton of *Ceratosaurus* shows small, bony plates along the backbone, which might be the remnants of armour. Most of these bones are small, and might have been for decoration, rather than protection.

